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November 27th, 1959

COCOM Document No. 3715.45/1B

COORDINATING COMMITTEE

RECORD OF DISCUSSION

ON

ITEM 1545 - TRANSISTORS

10th and 17th November, 1959

Present: Belgium (Luxembourg), Canada, France, Germany, Italy, Japan, Netherlands, United Kingdom, United States.

References: COCOM 3700.1, .2 and .5, W.P.1545/1, 2, 3 and 4.

1. The COMMITTEE based the review of this item on the redefintiion proposal submitted by the United Kingdom Delegation.

2. The UNITED KINGDOM Delegate stated that the present definition covered types of equipment which were circulating freely in the commercial sector. He added that his authorities attached great importance to the revision of Item 1545 and regarded the proposal they had submitted as a minimum.

3. The UNITED STATES Delegate stated that the United Kingdom proposal was much too liberal. Studying in details the production of transistors within the Bloc, he stressed the time lag which existed between United States production and Soviet production. This time lag, he stated, was approximately three to four years. The United States Delegate added that, according to the definition proposed by the United Kingdom, only twelve types of transistors would be under embargo, and none of them was available except to the military. On the other hand, the United Kingdom proposal would release materials not even in current use in the Western world.

4. The GERMAN Delegation suggested the freeing of transistors using germanium, pointing out that most of them sere in civilian use, while the other types of transistors were covered by part (a) of the current defihition.

5. The UNITED STATES Delegation questioned this statement, and said that his authorities could not accept a proposal which would liberate all transistors using germanium, since extensive military use is made of those operating above 30 Mc/s. They believed that all of them involved special design.

6. The UNITED KINGDOM Delegation questioned whether the time lag between Soviet production and Western production was as great as that indicated by the United States Delegate. In the United Kingdom Delegate's view, this figure might be accurate where United States production was concerned, but certainly not as far as concerned European production.

7. The UNITED STATES Delegation proposed the addition of a new part covering certain types of transistors, how in production or under development, and incorporating features of advanced technology. They also submitted a proposal for the clarification of the Notes appearing in Item 1545 (see W.P.1545/3).

8. The NETHERLANDS Delegation stated that their authorities were in favour of the idea which had inspired the United Kingdom proposal, but considered it too liberal. They had therefore submitted a counter-proposal in W.P.1545/2.

9. The COMMITTEE instructed the Working Group to look for a wording taking into account the various positions which had been stated.

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10. The Working Group submitted in W.P.1545/4 the following new definition:

"Transistors and related devices (or related semi-conductor amplifying devices such as fieldistors, specistors and technetrons) and specialised parts therefor, the following:
(a) Of any type using any semi-conductor material having 4 or more active junctions within any single block of semi-conductor material;
(b) Of any type using a bulk semi-conductor material other than germanium;
(c) Using germanium as the bulk semi-conductor material and having any of the following characteristics:
(1) a maximum collector dissipation of more than 150 mW and a minimum guaranteed f alpha greater than 33 Mc/s or an average f alpha greater than 50 Mc/s;
(2) the product maximum collector dissipation (in watts) by minimum guaranteed f alpha (in Mc/s) greater than 5, or maximum collector dissipation (in watts) by average f alpha (in Mc/s) greater than 7.5;
(3) a minimum guaranteed f alpha greater than 90 Mc/s, or an average f alpha greater than 150 Mc/s;
(d) Designed to operate at switching rates (repetition frequencies) in excess of 500 Kc/s.

NOTES: 1. A transistor is an electronic device incorporating a semi-conducting material, in which the current flowing between two electrodes is controlled by the voltage or current at another electrode. Subject to the above definition, this item is intended to cover all devices incorporating a semi-conducting crystal of any material with three or more electrical connections or with only two such connections where 4 or more active junctions exist within a single bloc of semi-conductor material, which are used as amplifiers, oscillators, trigger devices, etc., or combinations thereof in electronic circuits. For phototransistors see Item 1548.
2. The maximum collector dissipation is to be defined as the continuous dissipation measured at an ambient temperature of 25°C. and under any cooling conditions.
3. f alpha is the frequency at which the modulus of the current gain in the common base connection has decreased to 0.707 of its low frequency value.
4. Where f1 (the frequency at which the modulus of the current gain in the common emitter connection is equal to 1) is quoted instead of f alpha, f1 may be regarded as 1.2 times f alpha."

11. The above definition was accepted ad referendum by all Delegations. The FRENCH and GERMAN Delegations nevertheless reserved their positions as to the text of paragraphs 3. and 4. of the Note set out above.

12. On the 17th November, the NETHERLANDS Delegate informed the Committee that his Delegation intended to submit a proposal for an amendment to the text of the new definition set out above. This proposal was issued on the 18th November in W.P. 1545/5.

CONCLUSION: The COMMITTEE took note of the NETHERLANDS Delegate's proposal and of the reserves expressed by the French and German Delegations, while registering the agreement in principle of all Delegations to the definition set out above. They agreed to study the Netherlands proposal during the second round of the review of the Electronics Category.